

Map Unit Properties Table

Age	Unit Name (Symbol)	Features and Description	Erosion Resistance	Suitability for Development	Hazards	Potential Paleontologic Resources	Potential Cultural Resources	Mineral Specimens	Potential for Karst Issues	Mineral Resources	Habitat	Recreation Potential	Global Significance
QUATERNARY	Fill, alluvium, colluvium, lacustrine deposits, mass-movement, fan deposits and loess (Qf, Qal, Qae, Qai, Qaf1, Qap, Qc, Qam, Qls, Qlu, Qes, Qai/Qls, Qla, Qmc, Qmt, Qrm, Qms, Qas, Qli, Qlg, Qlg, Qll, Qls, Qlm, Qa, Qaf2, Qlf)	Assorted silts, sands, gravels and clays in streams, terraces, and lakes (Lake Bonneville shorelines and lake bottoms). Dark brown silts, sands and clays in flood plain deposits. Poorly sorted gravel, sand, silt and clay in alluvial fans. Some sand and silt are wind transported. Blocky, unsorted debris as talus fans and slides at the bases of slopes, and along former lake shores along with deposits of ooid sands	Very low	Unconsolidated deposits could fail if water saturated and should be avoided for waste facilities and large structures, especially if slope is present	Slumps, slides, mass movement, flash flood washes, seismic activity and liquefaction a threat, gullying, debris flows and floods	Unknown	Valley fills on present land surface, ancient campsites?	None	None	Sand, gravel, clay, silt, boulders	Present day land surface, habitat for animals and plants	Good for all uses unless slope is present to create unstable, unconsolidated surface	Bonneville beach deposits record levels of glacial Lake Bonneville in regionally correlative terraces
QUATERNARY-TERTIARY	Alluvial Fan Deposits (QTaf3)	Unit is composed of moderately consolidated to caliche-cemented, poorly sorted deposits of boulders, cobbles, and pebbles forming highly dissected fans and terraces.	Very low to low	Poor cementation is likely to fail on slopes, high permeability for waste facility development	Slumps, slides and rockfall	Modern fossils possible	Ancient campsites, hunting areas	Caliche	None	Boulders, cobbles	Crevices and pores for burrows	Good for most recreation	Records rapid uplift
	Alluvium and Loess (QTal)	Unit is unconsolidated to cemented, white caliche-coated boulders, cobbles, and pebbles of quartzite, shale and siltstone near terrace crests. Underlain by red, well-bedded alluvium and fine sand and silt-sized loess. Thin to thick bedded.	Very low to low	Poor cementation is weak on slopes, high permeability for waste treatment	Rockfall, slides, slope creep	Modern fossils possible	Ancient campsites, hunting areas	Caliche	None	Boulders, cobbles, pebbles	Crevices and pores for burrows	Good for most light recreation	Records rapid uplift
TERTIARY	Eolian Loess and Alluvial Gravel (Tel)	Combined units of moderately consolidated red loess composed of locally thick accumulations of fine sand and silt size particles. Alluvium is well bedded with clasts of rounded to subangular quartzite, limestone, shale and siltstone.	Low	Low consolidation makes unit vulnerable to rockfall and sliding, okay for most recreational use	Rockfall and slides, weak shales	Modern fossils possible, or derivations from earlier units	Ancient campsites, hunting areas	None	Some dissolution in limestone	Sand, silt	Crevices and pores for burrows	Picnic areas, campsites, trails	Records rapid uplift
	Basalt (Tb)	Dark gray to very dark gray, fine grained to very fine grained, crystal-rich olivine-pyroxene-plagioclase basalt. Classified as olivine tholeiite basalt and consists of lava flows 3 to 12 m (10 to 40 ft) thick, each generally with a vesicular top and bottom. Flagggy to slaty appearance also present at some flow boundaries. Breccia present between some flows. Contains sparse phenocrysts of plagioclase, pyroxene, and quartz. Dated at about 3.5 Ma.	Moderate to high	Rough nature of surface makes it a poor choice for recreational development.	Blockfall if undercut on slope, rough uneven surfaces for walking	None	Unknown	Oil and gas potential, phenocrysts plagioclase, pyroxene, quartz	None	Basalt rocks	Vesicles and crevices between flow provide burrow habitat	Rough trail base, unstable footing	3.5 Ma volcanic activity in the region, fresh surfaces
	Sedimentary Rocks and Tuff (Tt)	Unit is moderately consolidated, gray to brown air-fall tuff and tuffaceous rock redeposited in fluvial and lacustrine environments, and conglomerate and sandstone. Air-fall tuff is mainly glass shards, locally with feldspar and pumice. Redeposited tuff, generally sand and silt sized, contains varying amounts of lithic fragments. Unit is interbedded with sand, silt, and marl containing little tuff.	Low	Unit is suitable for most development, except in areas of pumice concentration (sharp surfaces)	Sharp volcanic glass surfaces, rockfall, slumps in lacustrine deposits	Modern fossils possible	Unknown	Pumice, tuff, shards, opals	None	None	Unknown	Sharp clasts should be avoided for trails	K-Ar dates of ~9-18 Ma, Records volcanic activity in the area
	Salt Lake Formation (Ts)	Unit is moderately consolidated, gray to brown air-fall tuffaceous rock redeposited in lacustrine environment. Redeposited tuff, generally sand- and silt-sized and yellow to green, contains varying amounts of lithic fragments, and is size-sorted and bedded; interbedded with sandstone, shale, and marlstone. Minimum thickness equals 100 m (330 ft).	Low	Low consolidation makes unit vulnerable to rockfall and sliding, okay for most recreational use	Rockfall, slides, slope creep	Modern fossils possible	Unknown	Tuff deposits	Some karst dissolution in marlstone	None	Unknown	Good for most light recreation	Radioactive dating, lacustrine deposits with volcanic record
	Thatcher Mountain Formation	Upper Member (Pt)	Moderate to high (increases with chert content)	Suitable for most development unless highly fractured	Rockfall, blockfall	Scant fossils in limestone layers	Chert nodules may have provided ancient tool material	None	Some in limestone and dolomite beds	Flagstone material	Dissolution pockets may provide nesting habitat	Climbing and most other recreation	Type section at Thatcher Mountain, paleocurrent in crossbeds
LOWER PERMIAN UPPER PENNSYLVANIAN	Oquirrh Formation	Cherty Member (Ptc)											
		Thinly Bedded Member (Pot)	High	Unit should be competent for most forms of development unless highly fractured or weathered	Rockfall hazard if rock is highly jointed or dissolved. Some shale layers may prove incompetent if highly weathered	Abundant early Pennsylvanian age fossils in conjunction with assorted fusulinids such as <i>Millerella</i> sp.	Chert nodules could have provided tool material	Fossils, banded layers	Karst potential exists for this unit	Building material, clean limestone	Vugs on cliff could provide nesting habitat, goat habitat	Good for most uses, weathered surfaces could prove hazardous for rock climbing.	Unique, thick banded member prominent in region, Pennsylvanian age fossils
		Sandstone member (Pos)											
		Silty limestone member (Posi)											
		Bioturbated Limestone Member (PPNob)											
		Limestone Member (PNol)											

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PENNSYLVANIAN	Manning Canyon Shale	Transitional Member (PNmct)	Transitional member is 150-210 m (490-680 ft) thick, whereas lower member is >915 m (3000 ft) thick. Unit forms layers of interbedded quartzite, siltstone, and medium-bedded fossiliferous limestone; transitional into the limestone member of the Oquirrh Formation. Units weather to tan and gray. Lower beds contain medium- to coarse-grained sandstone and bold, dark-brown quartzite interbedded with non-resistant gray to black shale and minor fossiliferous limestone	Low to moderate	Rock weathers easily making it a poor foundation base for structures and most permanent development, especially if a slope is present	Severe slumping and sliding hazards exist for this unit on slopes and/or if water saturated	Brown shale contains fossil plants and abundant marine fossils	None	Fossils	Not enough carbonate present	Disseminated gold potential, clay products, lightweight aggregate, pyrophyllite	Burrowing material if highly weathered, forms gentle slopes in canyons for plant and animal habitat	Not stable enough for heavy use	Contains boundary between Upper Mississippian and Pennsylvanian ages near middle of unit
		Lower Member (PNMmc)												
	Older Sedimentary Rocks (Pzs)	Unit contains beds of undifferentiated carbonate, sandstone, and shale typical of the region.	Moderate	Unit is suitable for most forms of development unless highly fractured	Rockfall, blockfall on slopes	Possible fossils in this unit	None	None	If carbonate content is high	None	Vugs on cliffs as nesting	Good for most recreation	Unknown	
MISSISSIPPAN	Great Blue Limestone (Mgb)	Present only beneath the surface this unit is locally cherty, thick-bedded limestone containing abundant coral fossils.	Moderate to high	Suitable for most development unless significant dissolution or weathering has occurred. Dissolution can pose a problem with waste facilities	Unit is only present in subsurface, some dissolution may produce caves and sinkholes	Late Mississippian age fossils	Chert nodules could have provided tool material	None	Karst potential exists for this unit	None documented	Caves and burrows	Unit is only present in subsurface	Type locality in the Oquirrh Mountains, thick carbonate deposit	
	Humbug Formation and Deseret Limestone, Undivided (Mhd)	Only present in cross section of the area, these units are composed of brown sandy and silty limestone and calcareous siltstone with abundant fossils of corals, brachiopods.	Moderate (weathers as caves)	Dissolution can create conduits which pose a problem for waste facilities and severe dissolution can make construction on this unit risky	Unit is only present in subsurface, some dissolution may produce caves and sinkholes	Late Mississippian age brachiopods and corals, crinoid stems, cup corals and colonial corals	Native Americans may have used any caves present, chert masses may have been tool material	Speleothems (if caves present), fossils	Karst potential exists for this unit	Attractive building stone	Caves provide animal habitat, esp bats	Good for most recreation, caves, climbing	Distinct bands, hosts Timpanogos Cave system	
	Gardison Limestone (Mg)	Only present in cross section of the area, unit is composed of dark-gray, thin-bedded limestone. Fossils are abundant.	High	Shaly partings can render the unit unstable for foundations and other permanent facilities	Unit is only present in subsurface, some dissolution may produce caves and sinkholes	Mississippian age fossils, some corals and brachiopods	Many chert nodules useful for ancient tools	Fossils	Some karst potential in carbonate beds	Locally uraniferous and phosphatic layers	Unknown for area	Unit is present in subsurface	Unit contains Mississippian fossils of Kinderhookian age	
DEVONIAN	Beirdniau Formation (Db)	Present in cross section only, calcareous sandstone, dark dolomite and limestone dominate this unit.	Moderate to high	Unit is only in subsurface in park area, dissolution increased permeability may factor in to waste facility development.	Unit is only present in subsurface, some dissolution may produce caves and sinkholes	Fossils possible, noted elsewhere for this unit	None	None	Karst potential exists for this unit	None documented	Unknown for area	Unit is present in subsurface	Records ancient basin in Utah	
	Hyrum Dolomite (Dh)	Unit is present in cross section only, but is composed of dolomite and limestone interbeds.	Moderate to high	Unit is only in subsurface in park area, dissolution increased permeability may factor in to waste facility development	Unit is only present in subsurface, some dissolution may produce caves and sinkholes	Fossils possible	None	None	Karst potential exists for this unit, esp in limestone beds	None documented	Unknown for area	Unit is present in subsurface	Records ancient basin in Utah	
	Water Canyon Formation (Dwc)	Present in cross section only, unit contains conspicuously laminated light and dark-gray dolomite present in outcrop as bands.	High	Unit is only in subsurface in park area, dissolution increased permeability may factor in to waste facility development	Unit is only present in subsurface, some dissolution may produce caves and sinkholes	Fossils possible	None	Banded dolomite	Some karst potential exists for this unit	None documented	Unknown for area	Unit is present in subsurface	Records ancient basin in Utah	
SILURIAN	Laketown Dolomite (Sl)	Unit is in cross section of the area only. Unit is composed of pale-gray to white dolomite with scant sandstone and limestone interbeds. Rather massive.	High	Unit is only in subsurface in park area, dissolution increased permeability may factor in to waste facility development	Unit is only present in subsurface, some dissolution may produce caves and sinkholes	Fossils possible	None	None	Karst potential exists for this unit	None documented	Unknown for area	Unit is present in subsurface	Records ancient basin in Utah	